REMARKS

Claims 1-63 are pending in the present application. Applicant has voluntarily amended Claims 19-24 without narrowing the scope of these claims, and not in view of the cited references. Applicant has also canceled Claim 59 without prejudice or disclaimer of the subject matter therein described. No new matter has been added. Reconsideration of the pending Claims is respectfully requested in view of the following remarks.

Information Disclosure Statements

In the office action mailed September 17, 2008, it was indicated that the Information Disclosure Statements filed May 7, 2008, January 25, 2008, January 18, 2008, July 23, 2007, November 21, 2005, and December 22, 2004 were considered by the Examiner. Applicant respectfully requests initialed copies of the Information Disclosure Statements filed on December 22, 2004, November 21, 2005, July 23, 2007, January 18, 2008, January 25, 2008 and May 7, 2008.

Drawing Amendments filed May 18, 2006

Applicant filed a voluntary amendment to the drawings on May 18, 2006. In the office action mailed September 17, 2008, it was indicated that the drawings filed December 22, 2004 were acceptable. Applicant respectfully requests confirmation that the voluntary drawing amendments filed May 18, 2006 were acceptable and that the amended drawings were entered into the case.

Unexamined Claim

Although Claim 31 was indicated as rejected on page 2 of the office action pursuant to 35 U.S.C. § 102(b), the office action mailed September 17, 2008 includes no basis for the rejection. Accordingly, Applicant respectfully requests examination on the merits of Claim 31, and the opportunity to fully respond to such an examination.

Rejections pursuant to 35 U.S.C. § 102(b)

In the Office Action mailed September 17, 2008, pending independent Claims 1, 9, 18, 29, 36, 45 and 53 as well as dependent Claims 4-8, 10-15, 17, 21-24, 30-35, 37-39, 41-44, 46-51, 54-58 and 62-63 were rejected pursuant to 35 U.S.C. § 102(b) as lacking novelty in view of US Patent No. 5,988,862 to Kacyra et al. (hereinafter Kacyra). Applicant respectfully traverses these assertions because Kacyra fails to teach or suggest each and every limitation of the presently pending claims.

Claims 1-8

Claim 1 describes a scanner operable to scan an object and provide scanner position data that includes a geographic position, slope and orientation of the scanner and image data representative of the object for each of a plurality of different geographic locations of the scanner in the vicinity of the object. Claim 1 also describes a computing system operable to generate a three-dimensional

electronic model of the object by fitting together the image data provided from each of the geographic locations based on the scanner position data.

Kacyra, on the other hand, describes a scanner operable to scan an object, but does not teach, suggest or disclose that the scanner is operable to provide scanner position data indicative of a geographic position of the scanner. In fact, the only location related information relative to the position of the scanner described by Kacyra is an "origin point" as identified on page 3 of the office action mailed September 17, 2008 in which it was asserted that Kacyra's "origin point is the scanner geographic position." However, as disclosed in the background section of Applicant's specification (paragraph 5, page 2), as well as Col. 1 lines 62-67, Col. 2 lines 1-3 and Col. 4 lines 26-29 of Kacyra, the origin point described by Kacyra is merely used to determine the distance between the scanner and an object being scanned to properly place a point representative of a part of the object in a point cloud. Clearly, a distance between an object and a scanner does not provide a geographic location since any number of geographic locations can be at the same distance from an object. Accordingly, the origin point as described by Kacyra is not scanner position data that includes a geographic position, slope and orientation of a scanner as provided in Claim 1.

Further, in Col. 17 lines 26-37, Kacyra describes a "video imaging device (typically a simple video camera) is fixed in a known position and orientation _relative_ to the scanning range-finding device." (*emphasis Applicant's*) Thus, not

only does Kacyra confirm his scanner is simply a range finding device, but also describes a camera in a fixed position <u>relative to the scanning range-finding device</u>. Accordingly, the position and orientation of Kacyra's video camera provides no geographic location data of a scanner as described in Claim 1, and instead simply allows a user to manually identify a region to be scanned with a mouse by indicating such a region on a video image produced with the video camera and displayed by a computer. (Col. 17 lines 31-36) Kacyra also describes that the scans are stored in association with the video images to access a picture of a scanned region by manually finding a video image of the region, or to isolate the scans taken from a given location. (Col. 27 lines 29-30) In Col. 28 lines 1-3 Kacyra describes that "[a] gridded mesh maintains information about the location of the scanner and the row and column ordering of its points." In Col. 27 lines 4-11 Kacyra describes creation of a range scan by "dragging out an axis aligned box on the video image" of an object so that the Kycra's system will generate a range scan from the region indicated in the video image that is "an axis aligned, approximately rectangular grid of depth information." Thus, the "location of the scanner" Kacyra is referring to in Col. 28 lines 1-3 is simply a portion of the region over which a scan was performed, which is quite clearly not scanner position data that includes a geographic location as described in Claim 1.

Moreover, even if one assumes, for purpose of discussion, that Kacyra describes a scanner that provides scanner position data that includes a geographic

position, which is clearly not the case, Kacyra does not teach, suggest or disclose a computing system operable to fit together the image data from each of a plurality of different geographic locations of the scanner based on the scanner position data as further provided by Claim 1. In fact, Kacyra teaches away from fitting together the image data based on scanner position data by teaching that "scan fields taken from different scanner positions _must_ be registered based on suitable primitives viewed from both positions" (_emphasis Applicants_) to combine different scans in a CAD model. (Col. 20 lines 12-14) Kacyra further describes that "primitives (or geometric primitives) such as planes, cylinders etc. can be used to replace groups of points." (Col. 18 lines 45-48) In addition, Kacyra teaches that "scan fields are an ordered grid of points." (Col. 17 lines 65-66) Further, Kacyra describes two methods of combining different scans that are used by his invention 1) matching three planes in each of the scans and 2) iterative processing to identify overlapping regions in the scans. (Col. 20 lines 15-29) In other words, Kacyra teaches away by describing that the same group of points MUST first be identified as an object in two different scans, and then the scans can be combined using the same group of points in each scan as a reference to overlay the two scans.

Claim 6 describes a position system operable to collect scanner position data. Page 4 of the office action mailed September 17, 2008, does not assert that Kacyra meets these limitations, but rather simply disregards these limitations completely. Accordingly, it is respectfully requested that the rejection of Claim 6 be withdrawn

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as improper. (See MPEP 707 and 37 CFR §1.104(b) and 37 CFR §1.104(c)) In addition, Claim 7 describes the computing system is operable to associate the color point data, the geometric point data, and the scanner position data to form a three-dimensional electronic image representative of only one scan of the object. Contrary to the assertions on page 4 of the office action mailed September 17, 2008, the cited portions of Kacyra do not teach or suggest association of scanner position data to form a three dimensional electronic image. Instead, Kacyra simply describes that "[e]ach data point in the point cloud 30 generated by the FDV represents both distance to a corresponding laser impingement point from an FDV 10 'origin point,'" which is not a geographic position as previously discussed, and representation of distance is quite clearly not association of scanner position data as described in Claim 7.

Claim 8 describes that the computing system is operable to selectively combine a plurality of three-dimensional electronic images as a function of the scanner position data to generate a three-dimensional electronic model. Kacyra, on the other hand, describes that "scan fields taken from different scanner positions *must* be registered based on suitable primitives view from both positions" as previously discussed. (*emphasis Applicant's*) Thus, Kacyra fails to teach or suggest the limitations of Claim 8.

Claims 9-15 and 17

Claim 9 describes a plurality of respective scans of the object from a plurality of respective geographic positions around the object, and a position system operable to provide position data of the point scanner and the color scanner for each of a plurality of geographic positions. Kacyra does not teach or suggest a position system operable to provide position data ... for each of a plurality of geographic positions as described in Claim 9. Instead, Kacyra simply describes distance information, as previously discussed. In addition to the previously discussed reasons, Kacyra also does not teach, suggest or disclose <u>a position system</u> operable to provide <u>geographic position data</u> of a point scanner <u>and</u> a color scanner as provided in Claim 9. Even if one assumes, for purposes of argument, that Kacyra includes a position system, which is not the case, any positioning taught by Kacyra is performed with the laser beam of the scanner and does not include the geographic position of a color scanner.

In addition, Claim 10 describes that the color sensor is a line sensor operable to measure a line of color. Not only does Kacyra fail to teach or suggest such a color sensor, but also, such limitations are not addressed by "the above passages" as asserted on page 6 of the office action mailed September 17, 2008. Instead, these limitations are simply disregarded completely. In addition, the limitations of Claim 12 regarding color point data associated with geometric point data, and the limitations of Claim 14 of a scan combining module and a geometric modeling

module were not addressed in "the above passages" and were likewise simply disregarded completely. Accordingly, it is respectfully requested that the rejection of Claims 10, 12, 14 and 17 be withdrawn as improper. (See MPEP 707 and 37 CFR §1.104(b) and 37 CFR §1.104(c))

Claim 13 describes a site computing system and a lab computing system, the site computing system is operable to perform a preliminary registration to form a preliminary three-dimensional electronic model, and the lab computing system is operable to perform precise registration of the preliminary three-dimensional electronic model to form a final three-dimensional electronic model. On page 6 of the office action mailed September 17, 2008, it was asserted that Fig. 39 of Kacyra was equivalent. Applicant respectfully traverses these assertions since the cited portions of Kacyra simply describe generation of scanning and modeling (left side) and data presentation/data import export (right side) (Col. 24 lines 58-67), which is clearly not performance of a preliminary registration and a precise registration as described in Claim 13. Moreover, Kacyra is simply describing the framework of a computer graphics perception (CGP) module operable on a data processing system such as a notebook computer or a graphics workstation (Col. 4 lines 12-18). Thus, Fig. 39 of Kacyra describes two parts of the same system, not a site computing system and a lab computing system as described in Claim 13. The scope of a claim in a patent application is determined by giving the claim its "broadest reasonable construction *in light of the specification* as it would be interpreted by one of

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ordinary skill in the art.'" *(Emphasis Applicant's)*. *See*, MPEP § 2111 *(citing In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827 (Fed. Cir. 2004); *see also, In re Marosi,* 710 F.2d 799, 218 USPQ 289 (Fed. Cir. 1983) ("Claims are not to be read in a vacuum, and limitations therein are to be interpreted in light of the specification in giving them their 'broadest <u>reasonable</u> interpretation'." 710 F.2d at 802, 218 USPQ at 292 (quoting *In re Okuzawa,* 537 F.2d 545, 548, 190 USPQ 464, 466 (CCPA 1976)) (emphasis in original). In the instant case, the office action has extended well beyond any broadest reasonable interpretation of the claim terms in light of the specification (see, for example, paragraphs [0072] and paragraphs [0077] of Applicant's specification). Accordingly, Kacyra does not teach or suggest such limitations.

On page 6 of the office action mailed September 17, 2008, it was asserted that "[e]ach layer is a set of stored database or software" was equivalent to the layers described in Claim 17. Applicant has carefully reviewed the cited portions of Kacyra and can find no such discussion. Moreover, Claim 17 describes specific layers in a three-dimensional electronic model, which are not taught or suggested by Kacyra.

<u>Claims 18 and 21-24</u>

Claim 18 provides means for scanning that is operable to determine position data that includes a geographic position, slope and orientation for each of a

plurality of different geographic locations of the means for scanning in the vicinity of the object. Claim 18 also provides a computing system operable to associate the position data with corresponding image data and dynamically fit together image data from each of different geographic locations based on the position data. Kacyra, on the other hand does not teach, suggest or disclose a means for scanning that is operable to determine position data, nor a computing system that associates the position data with corresponding image data. Even if one assumes for purposes of discussion that Kacyra does associate position data with corresponding image data, which is clearly not the case, Kacyra does not teach, suggest or disclose dynamically fitting together the image data from each of the geographic locations based on the position data as provided by Claim 18.

Moreover, Claim 18 includes means for scanning an object. "Where a claim limitation meets the 3-prong analysis and is being treated under 35 U.S.C. 112, sixth paragraph, the examiner will include a statement in the Office action that the claim limitation is being treated under 35 U.S.C. 112, sixth paragraph." MPEP 2181(I). In addition:

> When making a determination of patentability under 35 U.S.C. 102 or 103, past practice was to interpret a "means or step plus function" limitation by giving it the "broadest reasonable interpretation." Under the PTO's long-standing practice this meant interpreting such a limitation as reading on any prior art means or step which performed the function specified in the claim without regard for whether the prior art means or step was equivalent to the corresponding structure, material or acts described in the specification. However, in *Donaldson,* the Federal Circuit stated:

> Per our holding, the "broadest reasonable interpretation" that an examiner may give means-plus-function language is that statutorily mandated in paragraph six. Accordingly, the PTO may not disregard the structure disclosed in the specification corresponding to such language when rendering a patentability determination. (MPEP 2181)

Accordingly, Applicant respectfully asserts that the present rejections of Claim 18 disregard the structure disclosed in the specification and must be withdrawn.

Claims 29-35

Claim 29 provides instructions in a memory device to store a plurality of three-dimensional images that each include image data captured during a scan of an object. Claim 29 also provides instructions stored in the memory device to associate position data indicative of a geographic location and orientation of a scanner used to capture the image data with the image data captured from the perspective of that geographic location. In contrast, Kacyra fails to teach, suggest or disclose instructions in a memory device to associate position data indicative of a geographic location with the image data captured from the perspective of that geographic location as provided by Claim 29. To the contrary, Kacyra captures only image data that represents a distance, as previously discussed.

On page 7 of the office action, it was asserted that Kacyra describes development of a plurality of lines as described in Claim 33, however, Applicant has carefully reviewed the cited portions of Kacyra and can find no discussion of development of lines by joining geometric points as described in Claim 33.

Moreover, Applicant respectively traverses that the cited portions of Kacyra teach or suggest positioning of lines with respect to each other as described in Claim 34.

Claims 36-39 and 41-44

Claim 36 describes a method of developing a three-dimensional electronic model representative of an object. The method includes collecting image data and corresponding geographic position data of a scanner with a computer. The computer combines a plurality of three-dimensional electronic images developed from the image data as a function of the geographic position data that is associated with each of the three-dimensional electronic images. Kacyra, on the other hand, fails to teach or suggest the collection of image data and corresponding geographic position data of the scanner as provided in Claim 36. In addition, Kacyra fails to teach, suggest or disclose that a plurality of three-dimensional electronic images are combined as a function of the geographic position data. In fact, Kacyra teaches away from these limitations, as previously discussed.

Claim 38 describes determining color point data in a line of color within an area. Contrary to the assertions on page 8 of the office action mailed September 17, 2008, Kacyra fails to teach of suggest determining color point data in a line of color. In addition, Claim 43 describes selecting a source texture as a function of a texture of the object; developing a transformation procedure to create a complex texture from the source texture; and associating the transformation procedure with a surface of the three-dimensional electronic model. Kacyra fail to teach or suggest a

transformation procedure, or association of such a transformation procedure with a surface of a model. In addition, Claim 44 describes mirroring the image data from a scanned portion of the object to the symmetrical portion of the object, which Kacyra fails to teach or suggest. In fact, the office action mailed September 17, 2008 does not assert that Kacyra meets the limitations of Claims 43 and 44, but rather simply disregards them completely. Accordingly, it is respectfully requested that the rejection of Claims 43 and 44 be withdrawn as improper. (See MPEP 707 and 37 CFR §1.104(b) and 37 CFR §1.104(c))

Claims 45-50

Claim 45 provides a method of developing a three-dimensional electronic model representative of an object. The method includes scanning an object with a scanner from a plurality of positions to develop a respective plurality of three-dimensional electronic images. Each of the three-dimensional electronic images is represented with a plurality of geometric points in a point cloud and a plurality of color points. The method also includes portioning one of the three-dimensional electronic images into a plurality of sub-images and converting the geometric points and the color points into a plurality of lines representative of the respective sub-images. In addition, the method includes combining the lines to develop a three-dimensional electronic model. In contrast, Kacyra describes identification of geometric primitives such as planes, cylinders, etc. as previously discussed. Further,

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Kacyra describes formation of planes and other surfaces to replace groups of geometric points in a point cloud. (Col. 18 lines 45-52) Moreover, Kacyra does not teach suggest or disclose conversion of geometric points and color points into lines representative of respective sub-images as provided in Claim 45.

The only teaching related to lines in Kacyra is illustrated in Fig. 21 and involves connecting geometric primitives by identifying edges of planes as a line of intersection between the planes. (Col. 19 lines 19-37) Even if one somehow construes Kacyra as teaching conversion of geometric points to lines, which is clearly not the case, Kacyra teaches away from conversion of color points to lines by teaching that geometric primitives (or surfaces) are determined and then the new surface can be colored. (Col. 18 lines 45-52) (See also Col. 15 lines 41-52, "When a video image is captured it can be mapped onto a *surface* which is estimated by a lidar scan" (emphasis Applicant's)) Clearly conversion of both geometric points and color points to a plurality of lines representative of a sub-image as provided in Claim 45 is not taught, suggested or disclosed by Kacyra.

In fact, the office action mailed September 17, 2008 does not assert that Kacyra meets the previously discussed limitations of Claim 45, but rather simply disregards them completely. Accordingly, it is respectfully requested that the rejection of Claim 45 be withdrawn as improper. (See MPEP 707 and 37 CFR §1.104(b) and 37 CFR §1.104(c))

As described in Claim 46, the lines representative of the sub-images are stored as an outline data file. At least paragraph [0084] bridging pages 17 and 18 of Applicant's specification explains that replacing a large number of geometric and color points with lines in the form of outline data provides efficiency in data manipulation capability. In addition, Claim 48 describes that combining the lines comprises manipulating the lines with respect to each other to precisely fit together, Claim 49 describes combining the lines comprises minimizing error in the distance between one of the lines and another of the lines, Claim 50 describes compensating for height when the resting surface that the object rests upon is sloped, and Claim 51 describes filling gaps in color in the three-dimensional electronic model by rasterization. The office action mailed September 17, 2008 does not assert that Kacyra meets any of these limitations, but rather simply disregards them completely. Accordingly, it is respectfully requested that the rejections of Claims 46 and 48-51 also be withdrawn as improper.

Claims 53-58 and 62-63

Claim 53 provides a method of developing a three-dimensional electronic model representative of an object. The method includes capturing a plurality of scans of an object. Each of the scans includes image data representative of a three-dimensional electronic image and position <u>data</u> indicative of the position from which each scan was captured. The method also includes combining the scans to form a

three-dimensional electronic model of the object as a function of the position data, and texturizing the three-dimensional electronic model as a function of a source texture. As previously discussed, Kacyra does not teach suggest or disclose combining scans to form a three-dimensional electronic model of an object as a function of position data indicative of the position from which each scan was captured.

In addition, Kacyra does not teach, suggest or disclose texturizing a three-dimensional model with a <u>source texture that is an image identified with a unique identifier and stored in a texture library</u> as provided in Claim 53. In fact, Kacyra teaches that the texture is captured in a video image during scanning and precisely registered based on the geometric points obtained during a scan. (Col. 9 lines 52-56) Accordingly, Kacyra does not teach, suggest or disclose the use of a library or the use of a source texture identified with a unique identifier and stored in a library as provided in Claim 53. Further, Kacyra does not teach, suggest or disclose transformation procedures, complex textures created with a transformation procedure or association of a transformation procedure with the surface of a three-dimensional electronic model as provided in dependent Claims 55 and 57. Moreover, Kacyra fails to teach or suggest development of a plurality of lines as described in Claim 62, or replacing geometric points with color points with lines as described in Claim 63. To the contrary, Kacyra only describes identifying edges of planes as a line of intersection between the planes, as previously discussed.

For at least the previously discussed reasons, independent Claims 1, 9, 18, 29, 36, 45 and 53 and the Claims dependent therefrom are not anticipated by Kacyra. Thus, Applicant respectfully requests withdrawal of the 35 U.S.C. § 102(b) rejections of Claims 1, 9, 18, 29, 36, 45 and 53 as well as dependent Claims 4-8, 10-15, 17, 21-24, 30-35, 37-39, 41-44, 46-51, 54-58 and 62-63.

Rejections pursuant to 35 U.S.C. § 103(a)

Claims 2-3, 19-20, 40 and 59-61 were rejected pursuant to 35 U.S.C. § 103(a) as being obvious in view of the combination of Kacyra and US Patent No. 5,566,073 to Margolin (hereinafter Margolin). In addition, Claims 16 and 52 were rejected pursuant to 35 U.S.C. § 103(a) as being obvious in view of the combination of Kacyra, Margolin and US Patent Publication No. 2001/0056308 to Pctrov et al. (hereinafter Pctrov). These rejections are respectfully traversed since all of the limitations included in the presently pending Claims are not taught, suggested, or disclosed by the cited references either alone or in combination for at least the previously discussed reasons discussed with respect to Kacyra. Thus, a *prima facie* case of obviousness cannot be maintained.

In addition, Margolin describes a pilot aid for use in airplanes to simulate a three-dimensional map with a computer. The map is contained in a CD-ROM database that is accessed by the computer. (Col. 6 lines 30-33) The position of the plane is determined with a Global Positioning System (GPS) to place the position of

the plane with respect to the map and generate a view of the map for the pilot so the pilot can see the terrain in the vicinity of the plane even when visibility is poor. Thus, Margolin describes that the position of the plane is determined with GPS and shown on a map. However, aside from the use of GPS, the basic purpose and application of Margolin is so different from Applicant's invention that comparison is difficult. On page 9 of the office action mailed September 17, 2008, it was asserted that "[i]t is desireable to provide an electronic map with a 3D model drawing to facilitate understanding of objects and structures shown on the map." In addition, on page 10 of the office action, it was asserted that "it would have been obvious ... to use Kacyra's CAD in Margolin's system to develop an electronic map representing a synthetic environment for pilot aid because the combination generates an electronic map with a 3D model drawing to facilitate understanding of the map."

On the other hand, Applicant's invention is directed to an image generation system for developing three-dimensional models of objects. The resulting output of Applicant's system, namely three-dimensional models generated with Applicant's invention could be included in the CD-ROM database described by Margolin, but otherwise Applicant's invention as claimed has nothing to do with determining the position of an airplane on a map. In fact, Applicant's invention as described in the presently pending claims does not involve use of an electronic map at all. "[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational

underpinning to support the legal conclusion of obviousness" *KSR v. Teleflex*, 127 S. Ct. 1727, 1741 (2007)(citing In re Kahn, 441 F. 3d 977, 988 (CA Fed. 2006)). Further, in *KSR* the Supreme Court stressed that the analysis should be made explicit. *Id.* The Office Action mailed September 17, 2008, has failed to articulate any rational sufficient to support the legal conclusion of obviousness being asserted.
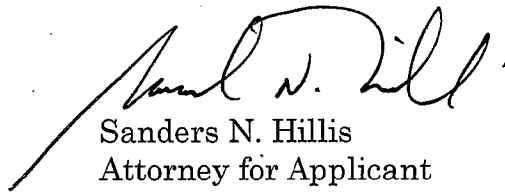
Even if it were obvious to use Kacyra's CAD in Margolin's system to develop an electronic map as asserted on page 10 of the office action mailed September 17, 2008, development of an electronic map is irrelevant to Applicant's invention as claimed. Moreover, the modification of Kacyra's system to generate three dimensional objects with Margolin's description related to the use of GPS and electronic maps simply yields indication of a vehicle position on an electronic map that includes a display of three dimensional images. Nowhere in either Kacyra or Margolin is determination of scanner position data and use the scanner position data to fit together image data provided from a plurality of geographic locations of the scanner in the vicinity of the object taught, suggested or disclosed. In fact, as previously discussed, Kacyra teaches away from such a suggestion by teaching other ways that **MUST** be used to combine scans collected from different scanner positions.

Accordingly, dependent Claims 2-3, 19-20, 40 and 60-61 are patentable over the combination of Kacyra and Margolin, and Applicant respectfully requests the withdrawal of the 35 U.S.C. § 103(a) rejections.

Conclusion

With this amendment and response, the present pending claims of this application are allowable, and Applicant respectfully requests the Examiner to issue a Notice of Allowance for this application. Should the Examiner deem a telephone conference to be beneficial in expediting allowance/examination of this application, the Examiner is invited to call the undersigned attorney at the telephone number listed below.

Respectfully submitted,

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